REMARKS

Claims 1-48 are pending in this application. Non-elected claims 8, 9, 13-30 and 32-48 are withdrawn from consideration.

I. Request for Examiner-Initialed PTO-1449 Form

In accordance with the Request for Examiner-Initialed PTO-1449 Form submitted herewith, Applicants respectfully request the Examiner to expressly consider the Watanabe et al. reference, and return an Examiner-initialed copy of the PTO-1449 Form to Applicants' attorney.

II. Withdrawal of Claim Rejections and Objection Not Reiterated in the Office Action

On page 6 of the Office Action, the Examiner states that Applicants' arguments filed June 15, 2009 have been fully considered but they are not persuasive. In the previous Office Action, the Examiner rejected claims 1-4, 7, 10, 11 and 12 under 35 U.S.C. § 102(b) as being anticipated by Kim et al., and objected to claims 11, 12 and 31. The rejection and objections were not reiterated in the last Office Action. Accordingly, Applicants presume that the rejection and objections have been overcome, and request the Examiner to expressly withdraw the rejection and objections in the next Official Action.

III. Double Patenting Rejection

The Examiner provisionally rejects claims 1-7, 10-12 and 31 on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-4 of copending Application No. 11/943,207.

The Examiner provisionally rejects claims 1-7, 10-12 and 31 on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 45-70 of copending Application No. 12/225,069.

The Examiner provisionally rejects claims 1-7, 10-12 and 31 on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-56 of copending Application No. 11/727,729.

Applicants respectfully request that the Examiner hold these rejections in abeyance, pending an indication that the claims are otherwise allowable.

IV. Claim Rejection Under 35 U.S.C. § 102

The Examiner rejects claims 1-4, 7, 10, 11 and 12 under 35 U.S.C. § 102(b) as being anticipated by Abe et al. Applicants respectfully traverse the rejection.

Claims 1, 3 and 4 recite a "magnesium alloy **casting product**" comprising "a" atomic% of Zn, "b" atomic% of Y and a residue of Mg, wherein "a" and "b" satisfy expressions (1) to (3).

Although the reference does not disclose a "casting product", the Examiner asserts that casting does not exclude rapid solidification. Applicants respectfully disagree.

One of ordinary skill in the art would recognize, as evidenced by the dictionary definition, that "casting" is an object made by pouring liquid metal into a mold (i.e., a specially shaped container). For example, Cambridge Dictionary defines a cast as "an object made by pouring hot liquid into a container and leaving it to become solid" (see http://dictionary. cambridge.org/define.asp? key=11789&dict=CALD&topic=models-and-moulds).

In contrast, rapid solidified powder metallurgy processing (rapid solidified ribbon-consolidation processing) does not use a mold. Therefore, the rapid solidified powder metallurgy process disclosed in the Abe et al. reference is not "casting". Thus, casting excludes rapid solidification.

Therefore, the reference fails to disclose a "magnesium alloy casting product", as recited in claims 1, 3 and 4.

Accordingly, claims 1, 3 and 4 are not anticipated by the reference.

Claims 2, 7, 10, 11 and 12 depend directly or indirectly from claim 1, 3 or 4, and thus also are not anticipated by the reference.

V. Claim Rejections Under 35 U.S.C. § 103

A. Abe et al. in view of JP 05306424

The Examiner rejects claims 5 and 6 under 35 U.S.C. § 103(a) as being unpatentable over Abe et al., and further in view of JP 05306424. Applicants respectfully traverse the rejection.

The arguments above regarding Abe et al. are also applicable to this rejection. Accordingly, the reference does not teach or suggest a "magnesium alloy casting product".

Moreover, the Examiner admits that the Abe et al. reference does not teach hcp-Mg phase grain size and dislocation density (see Office Action, page 5, lines 9-10). However, the Examiner asserts that JP 05306424 discloses that the Mg matrix average grain size is limited to 5 μm, and that this disclosure is in the same field of endeavor as the claimed invention.

As discussed in the previous response, the crystal structure of the rapidly solidified magnesium alloy of the Abe et al. reference has a submicron crystal grain size, and **does not have a crystal grain that is significantly larger in size as compared with the submicron size crystal grain**. The crystal structure of the magnesium alloy casting product of the claimed invention has a much larger crystal grain size as compared with the submicron size crystal (e.g., a crystal grain size of 2 μm or more).

The Examiner asserts that Applicants failed to provide factual evidence to substantiate this position regarding crystal grain size. One of ordinary skill in the art would clearly recognize the difference between a crystal grain size of a rapidly solidified magnesium alloy and the crystal grain size of the magnesium alloy casting product of the claimed invention.

Applicants provide the following figures demonstrating this distinction. Fig. 1 (below) shows a TEM (Transmission Electron Microscope) image of a rapidly solidified $Mg_{97\%}Zn_{1\%}Y_{2\%}$ alloy. The average crystal grain size of the rapidly solidified $Mg_{97\%}Zn_{1\%}Y_{2\%}$ alloy is about 300 nm (**0.3 μm**).

The method of manufacture of the rapidly solidified $Mg_{97\%}Zn_{1\%}Y_{2\%}$ alloy is as follows: $Mg_{97\%}Zn_{1\%}Y_{2\%}$ alloys were prepared by induction melting in an argon atmosphere. The compositions are nominally expressed in atomic percentage. The rapidly solidified $Mg_{97\%}Zn_{1\%}Y_{2\%}$ ribbons were prepared by a single roller melt-spinning method in an argon atmosphere. Cooling rate of $Mg_{97\%}Zn_{1\%}Y_{2\%}$ ribbons are 400,000 kelvin/second.

On the other hand, Fig. 2 (below) shows an OM (Optical Microscope) image of $Mg_{97\%}Zn_{1\%}Y_{2\%}$ alloy casting product. The average crystal grain size of the $Mg_{97\%}Zn_{1\%}Y_{2\%}$ alloy casting product is about **400 μm**. The method of manufacture of the casting product is as follows: $Mg_{97\%}Zn_{1\%}Y_{2\%}$ alloys were prepared by induction melting in an argon atmosphere. The compositions are nominally expressed in atomic percentage. The $Mg_{97\%}Zn_{1\%}Y_{2\%}$ alloy casting product was prepared by a gravity casting method that used an iron mold in an argon atmosphere.

Further, Fig. 3 (below) shows an OM image of extruded $Mg_{97\%}Zn_{1\%}Y_{2\%}$ alloy. The average crystal grain size of the recrystallization region of the extruded $Mg_{97\%}Zn_{1\%}Y_{2\%}$ alloy is only about **4 μm**. The manufacture method of the extruded $Mg_{97\%}Zn_{1\%}Y_{2\%}$ alloy is as follows: the **casting product** was extruded at a condition of a temperature of 350°C and an extrusion rate of 10.

Fig 1.

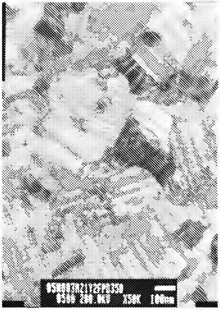


Fig. 2

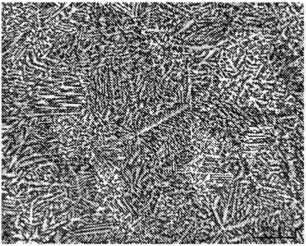
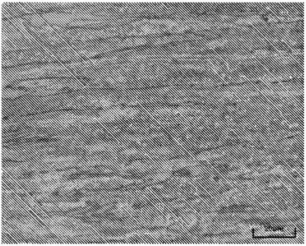


Fig. 3



As can be seen from the comparison of Figs. 1-3, the crystal structure of the rapidly solidified magnesium alloy of the Abe et al. reference has a submicron crystal grain size, and does not have a crystal grain that is significantly larger in size as compared with the submicron size crystal grain of the claimed invention.

Therefore, the Abe et al. reference does not teach or suggest a **hcp structured magnesium phase having an average particle size of 2 µm or more**, as recited in claim 5; and the reference does not teach or suggest a long period stacking ordered structure phase having **at least single-digit smaller dislocation density than the hcp structured magnesium phase**, as recited in claim 6.

JP 05306424 does not remedy the deficiencies of Abe et al.

Accordingly, claims 5 and 6 would not have been obvious over Abe et al. in view of JP 05306424.

B. <u>Abe et al. in view of Fisher</u>

The Examiner rejects claim 31 under 35 U.S.C. § 103(a) as being unpatentable over Abe et al., and further in view of Fisher (US 3,334,998).

The arguments above regarding Abe et al. are also applicable to this rejection.

Fisher fails to teach or suggest a "magnesium alloy casting product", as recited in claims 1, 3 and 4. Accordingly, Fisher fails to remedy the deficiencies of Abe et al.

Claim 31 depends directly from claims 1, 3 or 4, and thus also would not have been obvious over the references.

VI. Conclusion

For these reasons, Applicants take the position that the presently claimed invention is clearly patentable over the applied references.

Therefore, in view of the foregoing amendments and remarks, it is submitted that the rejections set forth by the Examiner have been overcome, and that the application is in condition for allowance. Such allowance is solicited.

Respectfully submitted,

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